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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Frank C. Smith, Jr.

Application No.: 10/701,146

Filed: 11/4/2003

Title: Cargo Oriented Aircraft

Attorney Docket No.: 50121



Art Unit:
3644

Examiner:
Tien Dinh

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

REFILED APPEAL BRIEF

IN ACCORDANCE WITH 37 CFR 1.41

(i) Real Party in Interest

The party named in the caption of the brief is the real party in interest.

(ii) Related Appeals and Interferences

There are no appeals or interferences related to, or that will directly affect or be directly affected by, the Board's decision in the pending appeal, to Applicant's knowledge.

(iii) Status of Claims

Claims 1 - 11 are pending. Claims 1 - 11 are appealed. Claims 1 and 11 are the independent claims. Claims 2 - 10 depend on claim 1.

(iv) Status of Amendments

All amendments have been entered.

(v) Summary of Claimed Subject Matter – Concise Explanation of Subject Matter Defined in Each Independent Claim, Referring to Specification by Page (p) and Line Numbers and to Drawings

Concisely stated, the subject matter of claim 1 is a **“rear door (20) two-surface (12, 14) canard (10).”** (See Spec. p.4 line 29 – p.5 line 8; p.3 lines 6 - 8 and 14 – 16.)

The subject matter of claim 11 is a **“personal aircraft, rear opening canard with no empennage.”** See 10 in Figures 1A, 1B, 3A, 3B, 3C, 4A, 4B. See Spec. p.5 lines 10 –12; p.4 lines 19 - 20; p.3 lines 14 – 16.)

A “canard” (10 in figures) is a historic, although little utilized, aircraft design. (Spec. p.1, line 26 – p.2, lines 1; p.2, lines 25 - 28; Figures 1A, 1B, 3A, 3B, 3C, 4A, 4B.) The Wright brothers flew a canard. A canard is a “tail-first” airplane, having a smaller horizontal lifting surface

(12) in front of the wing or larger horizontal lifting surface (14). (Spec. p.2, lines 25 - 28; p.4, lines 32 - p.5, line 1; p.4, line 29.)

Claims 1 and 11 both recite a “cargo adapted aircraft” in the preamble. (Spec. p.3 lines 6 - 8.) The cargo adapted aircraft has a large opening at the rear of the fuselage through which objects can be loaded. The large opening permits loading bulky large objects. (See Figure 1A; Spec. p.3 lines 1 - 7.)

Claim 1 recites a canard (10) having two and only two “significant” horizontal lifting surfaces, the smaller lifting surface (12) in front of the larger lifting surface (14). (Spec. p.2 lines 24 - 26. See Figures 1A, 1B, 3A, 3C, 4A, 4B.) “Significant” indicates non-trivial, non-deminimus. (See Spec. p.4, lines 30 - 31.) Claim 1 further recites the rear opening having a door type of closure (See 20 in Figures 1C, 2; See Spec p.5, lines 29 - 31 and lines 5 - 17.)

Claim 11 recites a canard having “no empennage.” Empennage is a tail assembly of the airplane. Empennage, as used in the application, refers to a rear horizontal lifting surface attached to either fuselage or booms. (See Spec. p.1 fn.) Claim 11 further recites the aircraft as a “personal” aircraft. (See Figures 1A, 1B 3A, 3C, 4A. See Spec. p.2 lines 15 - 17.) A “personal” aircraft refers to an aircraft designed for six or less occupants with a gross weight limit of 5000 pounds and horsepower less than or equal to 500 hp. (See Spec. p.5, lines 8 - 11.)

(vi) Grounds of Rejection

Ground 1: Whether the phrase “only two significant horizontal lifting surfaces,” claim 1 line 2, is vague and indefinite, rendering claim 1 and those that depend thereon, claims 2-10, unpatentable under section 112, second paragraph.

Ground 2: Whether the phrase “door type of closure,” in claim 1 last line, is vague and indefinite, rendering claim 1 and those that depend thereon, claims 2-10, unpatentable under section 112, second paragraph.

Ground 3: Whether claims 1-6, 8,9, 10 and 11 are obvious over Sutton in view of Weaver and Rutan.

(vii) Argument

Ground 1 Whether the phrase “only two significant horizontal surfaces,” claim 1, line 2, is vague and indefinite under §112, second paragraph.

The Examiner maintains that the phrase “only two significant horizontal surfaces” in claim 1, line 2, is vague and indefinite. Applicant respectfully traverses. In the Response to Arguments section of the Final Office Action the Examiner also asks, in regard to claim 1, “what qualifies this as ‘significant’?”

Since the specific phrase at issue does not occur in independent claim 11, claim 11 appears allowable in regard to this §112 rejection.

First, a search reveals that “significant” is not uncommon in claims. To the contrary, “significant” is frequently found in claims. The Patent Office database of patents from 1976 to the present indicates that about 20,000 patents use the word “significant” in the claims.

MPEP §2173.05(b) Relative Terminology states that:

“The fact that claim language, including terms of degree, may not be precise, does not automatically render the claim indefinite under 35 U.S.C. 112, second paragraph. *Seattle Box Co., v. Industrial Crate and Packing, Inc.*, 731 F.2d 818,221 USPQ 568 (Fed. Cir. 1984). Acceptability of the claim language depends on whether one of ordinary skill in the art would understand what is claimed, **in light of the specification.**”

As exemplary text, on p.4, line 29 – p.5, line 3 of the Written Description, context and support for the meaning of “two and only two significant horizontal lifting surfaces” is found.

“A “canard” is sometimes referred to as a “tail-first” aircraft. The term “two-surface” canard is used herein to refer to an aircraft having two, and only two, significant (i.e. non trivial, non de minimus) horizontal lifting surfaces (independent of the fuselage and any booms, to the extent they could be said to offer a lifting surface,) with the smaller lifting surface (the canard surface) in front (of the wing). (Herein, left and right wings divided by a fuselage are referred to as one horizontal lifting surface. Similarly, left and right canard surfaces will be regarded as a single horizontal lifting surface for purpose of discussion and description herein.)”

Two and only two significant horizontal lifting surfaces are further discussed in Spec. p.2 lines 9 – 15 and lines 24 - 30; p.3 lines 9 - 11; p.4 lines 15 - 17.

Applicant submits that in light of the Written Description, including at least the above quote, one of ordinary skill in the art would understand what claimed by “two and only two significant horizontal lifting surfaces.” In regard to the Examiner’s question, “nontrivial,” and “non de minimus” are recited in the Written Description to qualify “significant.”

Ground 2 Whether “door type of closure” in claim 1, last line, is vague and indefinite under §112.

In regard to claims 1-10, the Examiner, asserts:

"Please note that 'type' is considered to be indefinite. See MPEP 2173.05(b)E."

Applicant respectfully traverses.

The phrase "door type of closure" does not occur in independent claim 11. Claim 11, thus, is allowable over this ground of rejection.

A search reveals that "type" is also frequently used and found in the claims. The Patent Office database of patents from 1976 to the present indicates over 200,000 patents using the word "type" in the claims.

Given the test of **MPEP §2173.05(b) Relative Terminology**, stated above, terms of degree, including the term "type," are not per se "indefinite." The test is again whether one of ordinary skill in the art would understand what is claimed in light of the specification. Under **§2173.05(b) Relative Terminology**, there is a subsection discussing the word "type." The addition of the word "type" to an otherwise clear expression can impermissibly extend the scope of the expression as to render it indefinite if it is unclear what "type" was intended to convey.

Such is not the case here. "A door type of closure" conveys that the opening has a "door" type of closure as opposed to another type of closure. There could be a spectrum of "other" types of closures for the opening. For instance, the opening could have a permanently sealed type of closure or a welded shut type of closure. In the specification, various "door types" of closure, and their advantages, are discussed on p.5, lines 4 - 7 and lines 29 - 31 and on p.6, lines 15 - 16.

Applicant submits that, in light of the specification, "door type of closure" would be understood by those of ordinary skill in the art and would not be impermissibly vague and indefinite, and it would be clear what "type" was intended to convey in the circumstances.

Ground 3: Whether claims 1-6, 8, 9, 10 and 11 are obvious over Sutton in view of Weaver and Rutan.

Claims 5, 6 and 11 are argued separately from claim 1 in regard to this ground. Claim 7 is allowable with regard to this ground of rejection

Background re Motivation for the Invention. When the instant inventor regularly flew a Piper Cherokee Six across the country, a constant problem was transportation upon arrival. It was difficult to rent a car or to secure taxi service at private airports. Private pilots typically try to rent cars from airport managers; otherwise, locals are required to pick them up. The instant inventor upon occasion resorted to carrying a bicycle or a small scooter on board. The ground transportation problem was particularly vexing because there was room in a Cherokee Six for a

600 pound motorcycle, by volume and by weight. (Spec, p.1, lines 10 – 12; p.4 lines 6 - 11.) However, there was no way to get the motorcycle in. (Spec p.1, lines 12 - 13.) Of course, a small car would be preferable, given an aircraft with a somewhat higher weight and volume accommodation limit than the Cherokee Six. (Spec. p.1, lines 10 – 11.)

The instant inventor with an aeronautical engineering degree from Cal Tech gave the matter thought over a period of time until the efficient, cost-effective solution dawned; i.e. create a rear door entry, to accommodate loading large bulky cargo, without otherwise adding untenable costs, through the novel means of adopting, or by resorting to, a “two surface canard” or a “no empennage” design. Experience flying model canards, constructing an experimental canard, accompanying Mr. Rutan flying an experimental canard, being connected to the Voyager project and witnessing a single tractor engine successfully tested with a canard, all convinced the instant inventor that the canard design was a cost effective feasible solution.

Rear fuselage door designs have traditionally, in the industry, utilized a “boom supported” empennage, as do references Read and Weaver (Spec. p.1, lines 24 - 26; p32, line 7; p3, lines 9 – 11.) Boom supported empennages, however, add too much weight, drag, expense and complexity to justify the bulky-cargo-capability they could afford. The traditional design, the boom supported empennage, just would not be cost competitive. (Spec. p.4, line 18.)

A “two-surface canard” design, or a “canard with no empennage,” however, offered a simple, elegant and cost effective solution to the problem of adding a rear door. (See p.4, line 20.) The advantage of cost effective rear loading should outweigh what are frequently merely, or largely, historically conditioned, “perceived” disadvantages of canard control. Like all designs, canards have pros and cons. Canards can be made to work. (Spec. p.2, lines 15 - 17.) This is an instance of “thinking outside the box,” fostered perhaps by unique aeronautical experience and education. For an example of the pros and cons of a canard design, see reference Rutan ‘800, column 2, line 27 to column 3 - line 18.

The instant inventor appreciated, based upon a particular combination of aeronautical training and experience, that the competition, upon adding up the pros and cons, between a canard control surface design and an empennage control surface design, was actually quite close. Habit and historical prejudice were significant determining factors in the popularity of the empennage design. The lack of cost effectiveness of an empennage design, however, for a rear loading cargo-oriented or cargo friendly aircraft should make the canard design the feasible solution. Canard design offers the cost-effective advantages of simplicity, lower drag, lower weight and less cost vis-à-vis a boom supported empennage design, for instance. A Cherokee Six sized aircraft could

load and unload a motorcycle, wheel chair, gurney, coffin, etc. (Spec. p.5, lines 1 - 2.) through a rear door while the canard design cost effectively replaced its empennage control surface system without adding impractical complexity, drag and expense (such as that associated with a boom supported empennage.) (Spec. p.2, lines 10 – 12.)

Re All Rejected Claims First of all, Sutton (a “flying wing”) appears to provide an improper primary reference for this obviousness rejection. Only a single word from independent claim 1, the word “aircraft” of the preamble, reads upon primary reference Sutton. (Only four words of independent claim 11 read on Sutton, the word “aircraft” of the preamble plus the phrase “having no empennage.”) It is not proper, Applicant submits, to selectively choose all elements from two separate references and then to add them to construct the invention out of whole cloth, so-to-speak, on some “blank slate” provided by a “pseudo” primary reference. It is not proper to use Sutton as a bulletin board to which the examiner, finding all of the elements of the independent claims in various other references, affixes those elements to construct the invention.

The Examiner does not assert a direct combination of secondary references Rutan and Weaver. (See the top of page 5 in the second Action where the Examiner expressly asserts that he is modifying the Sutton reference, not the Rutan or Weaver references.)

The Examiner admits that Sutton is silent on (1) an opening at the rear of the fuselage and (2) a canard design – the only two elements of claim 1 and the two key elements of claim 11. (And although Sutton has “no empennage,” Sutton is not a “personal” aircraft, as recited by claim 11.)

Tracking claim 1, Sutton is silent on “a large opening at the rear of the fuselage through which objects can be loaded, the opening having a door type of closure for flight” and on a “canard having two and only two significant horizontal lifting surfaces with the smaller lifting surface in front of the larger lifting surface.” All Sutton teaches in common with claim 1 is an “aircraft,” the word found in the preamble. (In regard to claim 11 all Sutton teaches is an aircraft having no empennage.)

The Examiner’s asserted motivation for adding Weaver’s door at the end of the fuselage to Sutton’s flying wing, “to easily load cargos,” is arbitrary. This motive comes from applicant’s invention. It is accompanied by no observations of need or of convenience in the context of Sutton’s flying wing. Furthermore, if one added Weaver’s door, why not add Weaver’s boom supported empennage? The Examiner’s selective picking just one element from Weaver and no more is not justified, other than by hindsight.

More importantly, Examiner's motive to combine Rutan's canard with Sutton's flying wing, "to increase maneuverability," is completely unsupported. This motive is without any justification in the references or from any asserted common knowledge, and in fact, the asserted combination flies in the face of Sutton's own observations. Sutton himself is familiar with the notion of a "forward control surface." See Sutton '245 column 1 lines 29 - 36. Yet Sutton does not advise or teach incorporating such a forward control surface into his flying wing. Rather, teaching away from such implementation of a canard, Sutton himself proposes an entirely different solution to his "diving" problem, the problem occasioned by the high lift flaps on his flying wing design. Sutton solves the diving problem with his inventive addition of "extendable retractable balancing elements A." Adding Rutan's "secondary wing system useable for aircraft" to Sutton's design would be redundant to Sutton's invention, and might destroy Sutton's invention by undoing the balancing of forces achieved by Sutton's "extendable retractable balancing elements A." Any asserted efficiency of the combination for the Examiner's stated purpose is completely unsupported.

There is no basis or substantiation for believing that selectively combining a canard from Rutan with Sutton's "flying wing" would, in fact, "increase maneuverability." The Examiner offers no reason for why or how "adding Rutan's canard to Sutton's [flying wing] design" would "increase maneuverability." There is no indication that Sutton's design needs "increased maneuverability." There is no reason presented why would one look specifically to "Rutan's canard" to "increase maneuverability" if Sutton were to need such.

In short, the asserted motives for the Examiner's combinations are arbitrarily selective, and appear to be solely based on hindsight. Absent motive to make the combinations, claims 1-11 cannot be deemed obvious.

Claims 5 and 6

None of the references teach or suggest that their inventions have particular application to "personal aircraft" (claim 6, as well as claim 11), or to "light personal aircraft" (claim 5.) (The definitions of "personal aircraft" and "light personal aircraft" are found in the Specification on p.5, lines 8 - 11.) The Examiner does not so assert. The crafts of Sutton and Weaver are clearly not personal aircraft. The Examiner fails to make a *prima face* case in regard to claims 5 and 6.

(viii) Claims Appendix

What is claimed is:

- 1. A cargo adapted aircraft, comprising:
a canard having two and only two significant horizontal lifting surfaces,
with a smaller lifting surface in front of a larger lifting surface; and
a large opening at the rear of the fuselage through which objects can be
loaded, the opening having a door type of closure for flight.**
- 2. The aircraft of claim 1 including yaw control surfaces on the wing.**
- 3. The aircraft of claim 1 having no empennage.**
- 4. The aircraft of claim 2 having no empennage.**
- 5. The aircraft of claims 1, 2, 3 or 4 wherein the aircraft is a light personal
aircraft.**
- 6. The aircraft of claims 1, 2, 3 or 4 wherein the aircraft is a personal aircraft.**
- 7. The aircraft of claims 1, 2, 3 or 4 that includes one tractor engine.**
- 8. The aircraft of claims 1, 2, 3 or 4 that includes two wing located engines.**
- 9. The aircraft of claims 1 or 2 without a boom-supported empennage.**
- 10. The aircraft of claims 1 or 2 including a pitch control surface on the smaller
horizontal lifting surfaces.**
- 11. A cargo-adapted personal aircraft, comprising:
a canard having two significant horizontal lifting surfaces with a smaller
lifting surface in front of a larger lifting surface;
a large opening at the rear of the fuselage through which objects can be
loaded; and
having no empennage.**

(ix) Evidence Appendix


None

(x) Related Proceedings Appendix

None

Respectfully Submitted,

7/12/15
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